Addressing the Four Threats in an International Context

Invasive Species

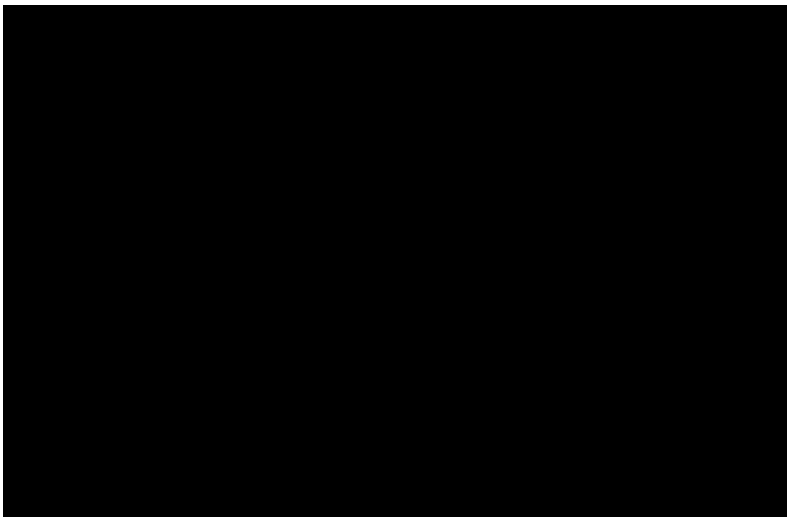
Introduction

The spread of invasive species is one of the four threats that the Chief of the Forest Service has identified as the main challenges to the management of national forests and grasslands in the United States.

Increasing population and demand for resources have led to an influx of exotic invasive species that can affect not only our nation's public and private forests but can also cross international boundaries.

Through International Programs, Research and Development, Forest Health Protection, and other government and nonprofit partners, the Forest Service is working to define and address invasive species issues in an international context. Our work focuses on sharing domestic experiences with international partners and learning from the experiences of countries that are addressing similar issues.

This paper describes the international scope of the invasive species threat, the actions currently being taken by the Forest Service and others internationally to address the problem, and options for future action that can be taken both globally and domestically.



Emerald Ash Borer. Photo by David Cappaert, forestryimages.com.

Scope of the Invasive Species Problem

Global extent of invasive species

In the past century, at least 4,500 species of non-native plants, animals, and microbes have become established in the United States, of which about 15% are considered harmful (OTA 1993).

Kudzu (an Asian vine) alone invades approximately 48,000 hectares (ha) (120,000 acres) in the U.S. each year (Britton 1999). In other parts of the world, invasion of non-native species can be even more severe, such as in

New Zealand where 47% of plant species are non-native (WRI 2003). These invasive species can have huge negative effects on local ecosystems and economies. For only one example, the Asian Longhorn Beetle alone could damage U.S. forest-based industries valued at $41 billion (Eav 1999).

Primary reasons why invasive species are spreading

Non-native, invasive species may be brought into the U.S. either intentionally (for example, as nursery or ornamental plants, domestic pets, food, fibers, etc.) or unintentionally (for example, insect pests in wood packaging, seeds stuck on tires, etc.). Changing land use patterns, increased global travel and trade, and other factors also contribute to the ability of invasive species to spread widely once introduced. Their unpredictability and sheer numbers, and the absence of natural biological controls on their growth, mean that new invasions may go undetected until they are already established.

Effects of invasive species

Invasive species compete for resources and growing space in native ecosystems, where quickly spreading newcomers can kill or crowd out threatened and endangered native species. In addition, many native species may be unprepared to defend themselves against introduced predators or diseases. These effects can be especially damaging in island ecosystems, where native species may have evolved in isolation from harmful diseases and predators. The World Resources Institute (WRI) states that invasive species are second only to habitat loss as a threat to biodiversity, threatening 20% of vulnerable terrestrial vertebrates (WRI 2003).

Lack of reliable information

Despite the escalating worldwide threats to ecosystems and communities from invasive species, we lack accurate and timely information about the basic biology and ecology of many invasive species (both terrestrial and aquatic); how they affect the reproduction and ecology of native plants and animals; and how we can better predict, prevoulece ers, af rmincurany invasive species. invasial plantnd animers, amior orgnd smcies ved

Bilateral technical cooperation

The Forest Service works bilaterally on a number of projects addressing invasive species, including:

Brazil—The Forest Service is partnering with Brazil's federal agricultural agency to experiment with and evaluate environmental controls for the Sirex wood wasp, which has infested pine plantations in Brazil.

Europe—The Forest Service has worked with European partners to research the control and origins of Sudden Oak Death.

Russia—In collaboration with USDA partners in APHIS, the Forest Service worked with the Russian government to identify the Asian gypsy moth in Russian ports to help prevent its introduction into international trade and the U.S.

Mexico—the Forest Service has partnered with Mexico to work on monitoring and research (including aerial detection) on invasive species that affect or potentially could affect both countries. The program currently focuses on cone beetles, which destroy the seed crop of native pines.

Multilateral forums and activities

Internationally, numerous initiatives and institutions address all four of the elements needed to control invasive species (see sidebar). The USDA is actively engaged in this work through sharing domestic expertise and learning from international experiences. For example:

- The Forest Service supported a Forest Invasive Species Conference in China in August 2003 and the 7th International Conference on Ecology and Management of Alien Plant Invasion in the U. S. in November 2003.
- The Forest Service is a member of World Conservation Union (IUCN), an international partnership of government agencies and non-governmental organizations interested in nature conservation. The IUCN hosts the Invasive Species Specialist Group (ISSG). This is an invited workgroup of researchers and policy makers from 41 nations, which produced the document *Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species* in February 2001(ISSG 2001), as well as a biannual newsletter.
- IUCN and the ISSG also host a Global Invasive Species Database, which provides a central repository where managers can learn about potential invasive species threats and response actions.
- Through the UN Food Agriculture Organization (FAO), the Forest Service works on regional commissions—such as the North American Forestry Commission (NAFC) and the Asia Pacific Forestry Commission (APFC)—to study invasive species and evaluate control mechanisms. For example, through the APFC, the Forest Service is working in China to study invasive species life histories and to determine whether biological or chemical controls exist that could be used against Asian longhorned beetle, beech bark disease, mile-a-minute weed, and kudzu.

Controlling invasive species

The control of invasive species centers around four main elements:

1. **Prevention of new, unwanted introductions of invasive species;**
2. **Early detection and rapid eradication of invasive species before they get established in non-native ecosystems;**
3. **Containment and management of established invasive species; and**
4. **Restoration of degraded ecosystems after invasive species are introduced.**

- The Forest Service reviews bilateral and multilateral trade agreements with other U.S. government agencies to understand and mitigate environmental impacts, such as whether the agreement might lead to increased opportunities for non-native species introductions.
- The Forest Service participates in international monitoring initiatives, such as the Montreal Process Criteria and Indicators, which encourage collection of data on invasive species.
- While the U.S. is not party to the Convention on Biological Diversity (CBD), Forest Service experts participate in invasive species working groups sponsored by the CBD to share information and establish guidelines for border control, mitigation, and management.
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Controlling international trade

Controls on species introduction can be complicated by trade agreements, which limit the ability to place controls on imports (Sandlund et al. 1996). Effective protection of native ecosystems from invasive threats must be balanced with the implementation of fair trade practices. Forest Service experts help address these concerns by providing input into the environmental assessments that accompany new free trade agreements.

Using global databases for monitoring invasive species

Finally, global databases and assessments, such as those run by the IUCN [http://issg.appfa.auckland.ac.nz/database/welcome/], can serve as early warning systems for potential invasive species problems, allowing rapid quarantine and control of new species (Mooney 1996). Their effectiveness will require timely coordination and distribution of information regarding threats and response. By proactively engaging in these databases—both by providing U.S. information and by encouraging others to do so—the Forest Service can increase the effectiveness of such cooperative efforts.

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For More Information

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Websites:

- IUCN Invasive Species Specialist Group, <http://www.issg.org/>
- The Nature Conservancy Invasive Species Initiative <http://nature.org/initiatives/invasivespecies/>
- Forest Service International Programs Invasive Species Projects <http://www.fs.fed.us/global/topic/welcome.htm#3>
- US Government Invasive Species Page, <http://www.invasivespecies.gov/>